

What is claimed is:

1. A vertical cavity surface emitting laser (VCSEL) comprising:

- a substrate;
- a first mirror situated on said substrate;
- an active region situated on said first mirror;
- a second mirror situated on said active region;
- a first contact situated on a first portion of said second mirror;
- a thermally conductive layer situated on a second portion of said second mirror; and

wherein said thermally conductive layer is thermally connected to said first contact.

2. The VCSEL of claim 1, further comprising a thermally conductive metal connected to said first contact.

3. The VCSEL of claim 2, wherein said substrate comprises InP.

4. A VCSEL comprising:

- a top mirror; and
- a thermally conductive cover on said top mirror.

5. The VCSEL of claim 4, further comprising a thermally conductive material connected to said thermally conductive cover.
6. The VCSEL of claim 5, wherein said top mirror comprises InP based material.
7. The VCSEL of claim 6, wherein said top mirror is designed for reflecting some radiation having a wavelength be 1200 and 1800 nanometers (nm).
8. The VCSEL of claim 7, wherein said thermally conductive cover comprises a material from a group of GaP, SiN, AlN, BN, SiC, diamond, and the like.
9. The VCSEL of claim 8, wherein said thermally conductive material comprises a material from a group of gold and like materials.
10. The VCSEL OF claim 4, further comprising a heatsink connected to said thermally conductive cover.

11. The VCSEL of claim 10, further comprising a first contact situated on said top mirror and thermally connected to said thermally conductive cover and said heat sink.

12. A VCSEL comprising:

a substrate;

a first mirror situated on said substrate;

an active region situated on said first mirror;

a second mirror situated on said active region;

a contact situated on a first portion of said first mirror;

a low thermal conductive covering situated on a second portion of said first mirror; and

a thermally conductive material connected to said contact.

13. The VCSEL of claim 12, wherein said substrate comprises InP.

14. The VCSEL of claim 13, wherein said first mirror comprises a material nearly lattice matched with the InP of said substrate.

15. The VCSEL of claim 14, wherein said thermally conductive material is for conducting heat from said second mirror via said contact.

16. The VCSEL of claim 15, wherein said thermally conductive material comprises material from a group of gold and other like materials.

17. The VCSEL of claim 16, wherein the VCSEL is for emitting a laser light having a wavelength between 1200 nm and 1800 nm.

18. The VCSEL of claim 15, wherein said contact comprises a thermally conductive material.

19. The VCSEL of claim 18, wherein said thermally conductive material is connected to a heat sink.

20. A VCSEL comprising:

a substrate;

a first semiconductor mirror situated on said substrate;

an active region situated on said first semiconductor mirror;

a second semiconductor mirror situated on said active region;  
a dielectric mirror situated on said second semiconductor mirror;  
a first contact situated on said first semiconductor mirror; and  
a metal interconnect connected to said first contact and in contact with an edge of said dielectric mirror; and  
wherein said dielectric mirror comprises thermally conductive material.

21. A VCSEL comprising:

a substrate;  
a first mirror situated on said substrate;  
an active region situated on said first mirror;  
a second mirror situated on said active region;  
and  
a thermally conductive material in contact with an edge of said second mirror.

22. The VCSEL of claim 21, further comprising a thermally conductive layer situated on said second mirror.

23. the VCSEL of claim 22, further comprising a thermally conductive material situated on said thermally conductive layer.

24. The VCSEL of claim 21, further comprising a contact situated on said second mirror.

25. The VCSEL of claim 24, further comprising a thermally conductive layer on said second mirror.

26. The VCSEL claim 25, further comprising a thermally conductive material situated on said second mirror and said contact.